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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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49444	7590	04/03/2007		
PEARL COHEN ZEDEK LATZER, LLP 1500 BROADWAY, 12TH FLOOR NEW YORK, NY 10036			EXAMINER TORRES, JUAN A	
			ART UNIT	PAPER NUMBER
			2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/748,180

Applicant(s)

PERETS ET AL.

Examiner

Juan A. Torres

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/24/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 11/24/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

The drawings are objected to because:

a) Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see specification paragraph [0001]). See MPEP § 608.02(g); and

b) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters: "300" and "400" have both been used to designate "communication device"; reference characters "310" and "410" have both been used to designate "antenna"; reference characters "320" and "420" have both been used to designate "receiver"; reference characters "330" and "430" have both been used to designate "detector"; reference characters "337" and "436" have both been used to designate "tap calculator"; reference characters "339" and "439" have both been used to designate "combiner"; reference characters "340" and "440" have both been used to designate "processor"; and reference characters "350" and "450" have both been used to designate "memory".

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

- a) The recitation in paragraph [0012] line 2 "ora" is improper because it is improperly constructed; it is suggested to be changed to "or a";
- b) The recitation in paragraph [0012] line 9 "orarticle" is improper because it is improperly constructed; it is suggested to be changed to "or article";
- c) The recitation in paragraph [0014] line 10 "refered" is improper because it is improperly constructed; it is suggested to be changed to "referred";
- d) The recitation in paragraph [0019] line 10 "combiner 337" is improper (see figure 3); it is suggested to be changed to "combiner 339"; and

e) The recitation in paragraph [0030] line 8 "439" is improper (see figure 4); it is suggested to be changed to "437".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 33-36 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 33-36 are rejected because they claim data structures not claimed as embodied in computer-readable media, and data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-13, 15-17, 19-23, 26-30, 33, 34 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Ostman (US 20010046221 A1).

As per claim 1, Ostman discloses detecting a desired symbol by allocating at least a first processing window to process the desired symbol within a first group of multipath components (figures 7, 8b and 10, WW1 paragraphs [0037]-[0039]); and allocating a second processing window to process the desired symbol within a second group of multipath components (figures 7, 8b and 10, WW1 paragraphs [0037]-[0039]).

As per claim 2, Ostman discloses claim 1, Ostman also discloses combining a first output of the first processing window with a second output of the second processing window into a single output (figure 10, block AR3 paragraph [0059]).

As per claim 3, Ostman discloses claim 1, Ostman also discloses determining a length for the first processing window, wherein the length of the first processing window is greater than a length of the desired symbol (figures 7, 8b and 10, WW2 paragraphs [0037]-[0039]).

As per claim 4, Ostman discloses claim 1, Ostman also discloses determining a length of the second processing window, wherein the length of the second processing

window is greater than a length of the desired symbol (figures 7, 8b and 10, WW2 paragraphs [0037]-[0039]).

As per claim 5, Ostman discloses claim 1, Ostman also discloses positioning the first and second processing windows around the desired symbol within the first group and within the second group, respectively (figures 7, 8b and 10, WW1 and WW2 paragraphs [0037]-[0039]).

As per claim 6, Ostman discloses claim 1, Ostman also discloses grouping two or more multipath components in the first and second groups based on a delay of the desired symbol within the two or more multipath components (figures 7, 8b and 10, PPK1-PPK5 paragraphs [0048]-[0049]).

As per claim 7, Ostman discloses a decoder having at least a first processing window unit to detect a desired symbol within a first group of multipath components and a second processing window unit to detect the desired symbol within a second group of multipath components (figures 8b and 10, WWS1 and WWS2 for figure 8b and f1-f3 for the first unit and f4-f5 for the second unit paragraphs [0056]-[0059]).

As per claim 8, Ostman discloses claim 7, Ostman also discloses a combiner to combine a first output signal of the first processing window unit with a second output signal of the second processing window unit to provide a single output signal (figures 8b and 10, block AR3 paragraph [0059]).

As per claim 9, Ostman discloses claim 7, Ostman also discloses a processor to determine a length of a first processing window of the first processing window unit and a length of a second processing window of the second processing window unit wherein,

the length the first processing window and the length of the second processing window are greater than a length of the desired symbol (figures 8a and 8b CPU paragraphs [009], [0041], [0045], [0049], [0051] and [0053]).

As per claim 10, Ostman discloses claim 9, Ostman also discloses a processor to position the first and second processing windows around the desired symbol within the first group and the second group, respectively (figures 8a and 8b CPU paragraphs [009], [0041], [0045], [0049], [0051] and [0053]).

As per claim 11, Ostman discloses claim 7, Ostman also discloses a processor to group two or more multipath components in the first and second groups based on a relative delay between the desired symbol within one multipath component and the desired symbol within another multipath component (figures 8a and 8b CPU paragraphs [009], [0041], [0045], [0049], [0051] and [0053]).

As per claims 12 and 33, Ostman discloses grouping two or more multipath components of a received baseband signal in one or more groups for detecting a desired symbol based on a delay spread of the two or more components (figures 8b and 10, block AR3 paragraph [0059]. Demodulators DMD provide baseband signals).

As per claims 13 and 34, Ostman discloses claims 12 and 33, Ostman also discloses grouping symbols within a first delay spread range in a first group (figure 8b and 10, WW1 paragraphs [0044]-[0045]); and grouping symbols within a second delay spread range in a second group (figure 8b and 10, WW2 paragraphs [0044]-[0045]).

As per claims 15 and 36, Ostman discloses claims 13 and 34, Ostman also discloses applying first and second processing windows to the first and second groups

Art Unit: 2611

using, respectively (figure 8b and 10, WW1 and WW2 paragraphs [0044]-[0045]); and combining softoutputs of the first and second processing windows into a desired output related to a detected symbol (figures 8b and 10, block AR3 paragraph [0059]).

As per claim 16, Ostman discloses claim 12, Ostman also discloses decoding by a processing window a desired symbol within first and second groups (figure 8b and 10, WW1 and WW2 paragraphs [0044]-[0045]); delaying a first processing result of the first group and a second processing results of the second group (figure 8b and 10, delay means DM101-103 and B10 paragraphs [0044]-[0045]); and combining the first processing result with the second processing result (figures 8b and 10, block AR3 paragraph [0059]).

As per claim 17, Ostman discloses claim 15, Ostman also discloses assigning different sizes to the first and second processing windows (figures 7, 8b and 10, L1 and L2 paragraphs [0017], [0037]-[0039] and [0044]).

As per claim 19, Ostman discloses claim 15, Ostman also discloses adaptively positioning the first or the second processing windows to encompass the desired symbol based on a communication system parameter (figures 7, 8b and 10, delay means τ_1 and $\Delta\tau_1$ and CPU paragraphs [0004], [0012] and [0049]).

As per claim 20, Ostman discloses claim 15, Ostman also discloses fragmenting the desired symbol into at least first and second fragments (figures 7, 8b and 10, L1 and L2 paragraphs [0017], [0037]-[0039] and [0044]); and applying the first processing window to the first fragment and the second processing window to the second fragment (figures 7, 8b and 10, WW1 and WW2 paragraphs [0017], [0037]-[0039] and [0044]).

As per claim 21, Ostman discloses claim 12, Ostman also discloses processing the desired symbol by applying to multipath components of the baseband signal at least one processing window to process the desired symbol in one group and at least one other processing window to process the desired symbol in two or more groups (figures 7, 8b and 10, WW1 and WW2 paragraphs [0017], [0037]-[0039] and [0044]).

As per claim 22, Ostman discloses a decoder having a processing window unit to decode a desired symbol within first and second groups of multipath components (figures 7, 8b and 10, WW1 and WW2 paragraphs [0017], [0037]-[0039] and [0044]); a first delay unit to delay a first processing result of the first group (figure 8b and 10, delay means DM101, B10 and DM103); and a second delay unit to delay a second processing result of the second group (figure 8b and 10, delay means DM102 and B10 paragraphs [0044]-[0045]).

As per claim 23, Ostman discloses claim 22, Ostman also discloses a combiner to combine the first processing result with the second processing result (figures 8b and 10, block AR3 paragraph [0059]).

As per claim 26, Ostman discloses an internal antenna to receive a signal having multipath components (figure 1 antenna in the MS unit paragraphs [0002], [0037], and [0039]); a decoder having at least a first processing window unit to detect a desired symbol within a first group of the multipath components and a second processing window unit to detect the desired symbol within a second group of the multipath components (figures 7, 8b and 10, WW1 and WW2 paragraphs [0017], [0037]-[0039] and [0044]).

As per claim 27, Ostman discloses claim 26, Ostman also discloses a combiner to combine a first output signal of the first processing window unit with a second output signal of the second processing window unit to provide a single output signal (figures 8b and 10, block AR3 paragraph [0059]).

As per claim 28, Ostman discloses claim 26, Ostman also discloses a processor to determine a length of a first processing window of the first processing window unit and a second processing window of the second processing window unit wherein, the length the first processing window and the length of the second processing window are greater than a length of the desired symbol (figures 8a and 8b CPU paragraphs [009], [0041], [0045], [0049], [0051] and [0053]).

As per claim 29, Ostman discloses claim 28, Ostman also discloses a processor to position the first and second processing windows of the first and second processing windows units around the desired symbol within the first group and the second group, respectively (figures 8a and 8b CPU paragraphs [009], [0041], [0045], [0049], [0051] and [0053]).

As per claim 30, Ostman discloses claim 26, Ostman also discloses a processor to group two or more multipath components in the first and second groups based on a relative delay between the desired symbol within one multipath component and the desired symbol within another multipath component (figures 8a and 8b PPk1-PPk5 paragraphs [0048]-[0049]; and CPU paragraphs [009], [0041], [0045], [0049], [0051] and [0053]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14, 24, 31 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ostman as applied to claims 12, 22, 28 and 33 above, and further in view of Poor ("Probability of Error in MMSE Multiuser Detection", IEEE Trans. Information Theory, vol. IT-43, No. 3, pp. 858 871, May 1997) (see also Applicant Admitted Prior Art in page 7 paragraph [0022], that could also be used to formulate this rejection).

As per claim 14, Ostman discloses claim 12, Ostman doesn't disclose processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection. Poor discloses processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection (abstract; and section III pages 858 and 861-863). Ostman and Poor are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the MMSE MUD disclosed by Poor in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to reduce the probability of error of the received signal (Poor abstract).

As per claim 24, Ostman discloses claim 22, Ostman doesn't disclose processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection. Poor discloses processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection (abstract; ans section III pages 858 and 861-863). Ostman and Poor are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the MMSE MUD disclosed by Poor in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to reduce the probability of error of the received signal (Poor abstract).

As per claim 31, Ostman discloses claim 28, Ostman doesn't disclose processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection. Poor discloses processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection (abstract; ans section III pages 858 and 861-863). Ostman and Poor are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the MMSE MUD disclosed by Poor in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to reduce the probability of error of the received signal (Poor abstract).

As per claim 35, Ostman discloses claim 33, Ostman doesn't disclose processing samples of the received baseband signal in the group by minimum mean squared error

Art Unit: 2611

multiuser detection. Poor discloses processing samples of the received baseband signal in the group by minimum mean squared error multiuser detection (abstract; and section III pages 858 and 861-863). Ostman and Poor are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the MMSE MUD disclosed by Poor in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to reduce the probability of error of the received signal (Poor abstract).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ostman as applied to claim 15 above, and further in view of Reznik (US 6748013 B2). As per claim 18, Ostman discloses claim 15, Ostman doesn't specifically disclose overlapping the first and second windows. Reznik discloses overlapping the first and second windows (figure 5 column 10 lines 12-35). Ostman and Reznik are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the overlapping technique disclosed by Reznik in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to reduce the computation time (Reznik column 10 lines 31-35).

Claims 25 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ostman as applied to claims 23 and 27 above, and further in view of Tirola (US 20010017883 A1) (see also Applicant Admitted Prior Art in page 7 paragraph [0022] , that could also be used to formulate this rejection).

As per claim 25, Ostman discloses claim 15, Ostman doesn't specifically disclose using a maximal ratio combining (MRC) method. Tirola discloses using a maximal ratio combining method (paragraph [0004]). Ostman and Tirola are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the MRC technique disclosed by Tirola in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to the influence of noise and interference (Tirola column 10 lines 31-35).

As per claim 32, Ostman discloses claim 27, Ostman doesn't specifically disclose using a maximal ratio combining (MRC) method. Tirola discloses using a maximal ratio combining method (paragraph [0004]). Ostman and Tirola are analogous art because they are from the same field of endeavor of multiuser systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate the MRC technique disclosed by Tirola in the reception technique disclosed by Ostman. The suggestion/motivation for doing so would have been to the influence of noise and interference (Tirola column 10 lines 31-35).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone

Art Unit: 2611

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres
01-28-2007

TEMESGNEAL GHEBREINSAE
PRIMARY EXAMINER
3/28/07